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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/035,754	12/29/2001	Prasenjit Sarkar	ARC920010097US1	3727

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EXAMINER

BOUTAH, ALINA A

ART UNIT	PAPER NUMBER
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2143

DATE MAILED: 03/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/035,754

Applicant(s)

SARKAR ET AL.

Examiner

Alina N Boutah

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2001.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-26 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 29 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/4/02.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

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DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,865,617 issued to Zeidner et al. (hereinafter referred to as Zeidner) in view of USPAPN 2003/0056000 submitted by Mullendore et al. (hereinafter referred to as Mullendore).

Regarding claim 1, Zeidner teaches a method of improving backup performance of block storage over a network with asymmetric traffic, comprising:

a client concurrently sending a write command and associated data to a server (col. 2, lines 16-48; figure 4: 401; col. 8, lines 41-43));

the server executing the write command (col. 9, lines 24-30; col. 10, lines 8-50);

the server combining a protocol acknowledgment message with a SCSI acknowledgment message, into an acknowledgment message, and transmitting the combined acknowledgment message to the client (abstract; col. 1, lines 46-57; col. 3, lines 3-21); and

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upon receipt of the combined acknowledgment message, the client recognizing a successful execution of the write command by the server (col. 10, lines 8-50).

However, Zeidner does not explicitly teach the server suppressing a SCSI RTT message and the client de-allocating a buffer that contains the associated data upon receipt of the combined acknowledgement message.

Mullendore teaches delaying a SCSI RTT message [0044-0056; 0058] and de-allocating a buffer that contains the associated data upon receipt of acknowledgement message [0060].

At the time the invention was made, one of ordinary skill in the art would have been motivated to delay a SCSI RTT message in order to reduce traffic, thus reducing latency, and de-allocating a buffer in order to ensure that data is received, thus maximizing the backup performance efficiency.

Regarding claim 2, Zeidner fails to teach the method of claim 1, wherein the server further selectively delays an issuance of the protocol acknowledgment message from the server to the client. Mullendore teaches the server further selectively delays an issuance of the protocol acknowledgment message from the server to the client [0044-0056; 0058]. At the time the invention was made, one of ordinary skill in the art would have been motivated to selectively delay an issuance of the protocol acknowledgment message from the server in order to reduce traffic, thus reducing latency.

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Regarding claim 3, Zeidner teaches the method of claim 2, wherein the protocol acknowledgment message is a TCP/IP acknowledgment message (abstract).

Regarding claim 4, Zeidner teaches the method of claim 3, wherein the combined acknowledgment message is a combined SCSI/TCP/IP acknowledgment message (abstract; col. 1, lines 46-57; col. 3, lines 3-21).

Regarding claim 5, Zeidner teaches the method of claim 2, wherein the client sends a sequence of asynchronous write commands to the server (figure 4).

Regarding claim 6, Zeidner fails to teach the method of claim 5, wherein the server delays the issuance of a combined SCSI/TCP/IP acknowledgment message for each of the write commands. Mullendore teaches the server further selectively delays an issuance of the protocol acknowledgment message from the server to the client [0044-0056; 0058]. At the time the invention was made, one of ordinary skill in the art would have been motivated to selectively delay an issuance of the protocol acknowledgment message from the server in order to reduce traffic, thus reducing latency.

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Regarding claim 7, Zeidner teaches the method of claim 6, wherein the server further merges combined SCSI/TCP/IP acknowledgment messages for at least some of the write commands into a batch SCSI/TCP/IP acknowledgment message (abstract; col. 1, lines 46-57; col. 3, lines 3-21).

Regarding claim 8, Zeidner teaches the method of claim 7, wherein the server sends the batch SCSI/TCP/IP acknowledgment message to the client (abstract; col. 1, lines 46-57; col. 3, lines 3-21).

Regarding claim 9, Zeidner fails to teach the method of claim 8, wherein in response to the batch SCSI/TCP/IP acknowledgment message, the client de-allocates buffers associated with the at least some of the write commands. Mullendore teaches de-allocating a buffer that contains the associated data upon receipt of acknowledgement message [0060]. At the time the invention was made, one of ordinary skill in the art would have been motivated to de-allocate a buffer that contains the associated data upon receipt of the combined acknowledgement message in order to ensure that data is received.

Regarding claim 10, Zeidner fails to teach the method of claim 2, wherein the server transmits the combined acknowledgment message to the client before an expiration of a predefined acknowledgment constraint window. Mullendore teaches transmits an

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acknowledgement message to the client before an expiration of a predefined acknowledgment constraint window [01120]. At the time the invention was made, one of ordinary skill in the art would have been motivated to transmit an acknowledgement message to the client before an expiration of a predefined acknowledgment constraint window in order to ensure that the client receives an acknowledge message.

Regarding claim 11, although both Zeidner and Mullendore do not explicitly teach the method of claim 10, wherein the predefined acknowledgment constraint window is approximately 500 msec, it is well known in the art that existing internet standards constraint state that the TCP ACKs cannot be delayed by more than 500 milliseconds, therefore it would have been obvious to predefine the constraint window to approximately 500 ms in order to ensure that the client receives an acknowledge message.

Regarding claim 12, Zeidner fails to teach the method of claim 2, further including the step of instructing the client to delay resending the write command and associated data to the server. Mullendore teaches a step of instructing the client to delay resending the write command and associated data to the server [0044-0056; 0058]. At the time the invention was made, one of ordinary skill in the art would have been motivated to enable a step of instructing the client to delay resending the write command and associated data to the server in order to reduce traffic, thus reducing latency.

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Regarding claim 13, Zeidner fails to teach the method of claim 12, wherein the instructing step comprises adding a predetermined delay interval to a round trip time. Mullendore teaches adding a predetermined delay interval to a round trip time [0044-0056; 0058]. At the time the invention was made, one of ordinary skill in the art would have been motivated to add a predetermined delay interval to a round trip time in order to reduce traffic, thus reducing latency.

Regarding claim 14, although Zeidner and Mullendore fail to teach the method of claim 13, wherein adding the predetermined delay interval comprises adding approximately 500 msec to the round trip time, it is well known in the art that existing internet standards constraint state that the TCP ACKs cannot be delayed by more than 500 milliseconds, therefore it would have been obvious to add approximately 500 ms to the round trip time in order to ensure that the client receives an acknowledge message and at the same time reduce traffic.

Regarding claim 15, Zeidner fails to teach the method of claim 1, wherein, upon detecting congestion, the server does not delay the issuance of the protocol acknowledgment message to the client. Mullendore teaches the server not delaying the issuance of the protocol acknowledgment message to the client [0044-0056; 0058]. At the time the invention was made, one of ordinary skill in the art would have been motivated to not delay the issuance of the protocol acknowledgment message to the client in order to reduce traffic, thus reducing latency.

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Regarding claim 16, Zeidner fails to teach the method of claim 15, wherein the server detects congestion by receiving a notification from the client. Mullendore teaches the server detects congestion by receiving a notification from the client [0044-0056; 0058]. At the time the invention was made, one of ordinary skill in the art would have been motivated to enable the server to detect congestion by receiving a notification from the client in order to reduce traffic, thus reducing latency.

Regarding claim 17, Zeidner fails to teach the method of claim 16, wherein the notification from the client comprises a message indicating a rate at which client buffers are getting full. Mullendore teaches a notification from the client comprising a message indicating a rate at which client buffers are getting full [0060]. At the time the invention was made, one of ordinary skill in the art would have been motivated to enable the client to comprise a message indicating a rate at which client buffers are getting full in order to allow it to allocate buffer, therefore making sure that there is space for received message.

Regarding claim 18, Zeidner teaches the method of claim 1, wherein the network comprises a wide area network (col. 1, lines 33-38).

Regarding claim 19, Zeidner teaches the method of claim 1, wherein the network comprises a local area network (col. 1, lines 33-38).

Regarding claim 20, Zeidner teaches a method of improving backup performance of block storage over a network with asymmetric traffic, comprising:

a client concurrently sending a write command to a server (figure 4);

the server executing the write command, and dynamically controlling a SCSI Ready to Transfer (RTT) message, if any is scheduled to be issued by the server (figure 4);

the server combining a protocol acknowledgment message with a SCSI acknowledgment message, into an acknowledgment message, and transmitting the combined acknowledgment message to the client (abstract; col. 1, lines 46-57; col. 3, lines 3-21); and

upon receipt of the combined acknowledgment message, the client sending data associated with the write command to the server (abstract; col. 1, lines 46-57; col. 3, lines 3-21).

Regarding claim 21, Zeidner fails to teach the method of claim 20, wherein upon recognizing a successful execution of the write command by the server, the client de-allocates a buffer that contains the data. Mullendore teaches de-allocating a buffer that contains the associated data upon receipt of acknowledgement message [0060]. At the time the invention was made, one of ordinary skill in the art would have been motivated to de-allocating a buffer in order to ensure that data is received, thus maximizing the backup performance efficiency.

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Regarding claim 22, Zeidner fails to teach the method of claim 21, wherein the server monitors a buffer consumption; and if the buffer consumption exceeds a predetermined level, the server sends a message to the client instructing the client to delay sending the data to the server. Mullendore teaches the server monitors a buffer consumption; and if the buffer consumption exceeds a predetermined level, the server sends a message to the client instructing the client to delay sending the data to the server the server monitors a buffer consumption; and if the buffer consumption exceeds a predetermined level, the server sends a message to the client instructing the client to delay sending the data to the server.

Regarding claim 23, Zeidner teaches the method of claim 22, further instructing the client to await a RTT message prior to sending the data to the server (figure 4; col. 8, lines 52 to col. 9, line 3).

Regarding claim 24, although Zeidner and Mullendore do not explicitly teach the method of claim 22, wherein the predetermined level is approximately 90% of a total server buffer capacity, one of ordinary skill in the art would have been motivated to allocate this buffer percentage in order to make sure that there is enough room for messages, therefore ensuring that the acknowledgment messages are received.

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Regarding claim 25, Zeidner fails to teach the method of claim 23, wherein if the buffer consumption is below the predetermined level, the server sends a message to the client instructing the client to not delay sending the data to the server. Mullendore teaches the server not delaying the issuance of the protocol acknowledgment message to the client [0044-0056; 0058]. At the time the invention was made, one of ordinary skill in the art would have been motivated to not delay the issuance of the protocol acknowledgment message to the client in order to reduce traffic, thus reducing latency.

Regarding claim 26, Zeidner fails to teach the method of claim 21, wherein the server further selectively delays an issuance of the protocol acknowledgment message from the server to the client. Mullendore teaches the server further selectively delays an issuance of the protocol acknowledgment message from the server to the client [0044-0056; 0058]. At the time the invention was made, one of ordinary skill in the art would have been motivated to enable the server to further selectively delay an issuance of the protocol acknowledgment message from the server to the client in order to reduce traffic, thus reducing latency.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alina N Boutah whose telephone number is 571-272-3908. The examiner can normally be reached on Monday-Friday (9:00 am - 5:00 pm).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David A Wiley can be reached on 571-272-3923. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ANB
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W.C. Vaughn
Primary Examiner
Art Unit 2143
William C. Vaughn, Jr.